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Note on the Spectrum of Comet e 1888 (Barnard, September 2).
By Dr. R. Copeland.

The spectrum was first examined on November 14. It presented a strange appearance, that at first sight was very puzzling, for instead of the feeble separate bands that usually characterise faint cometary spectra, the spectroscope revealed a rather long, continuous spectrum, extending from W.L. 575^{mmm} to W.L. 450^{mmm}, brighter in the middle and fading gradually away at both ends. It was, in fact, far more like that of a close globular cluster of stars, or a non-gaseous nebula, than of a mass of self-luminous gas. Owing to the spreading of the light over so great a part of the spectrum, a wide slit was imperatively necessary to permit of distinguishing any special features. Under this condition the spectrum seemed scarcely to differ from that of the zodiacal light or faint daylight, but on close scrutiny a soft, brighter patch of light was recorded at a point that turned out to have a W.L. of $510{\cdot}5^{\text{mmm}}$, and eventually an extremely feeble increase of light was detected at $476{\cdot}5^{\text{mmm}}$. These brighter patches probably represent the second and third cometary bands.

On November 26 similar observations were made, but with the addition that some traces of superposed brightness, indicative of the first band, were also distinguished. On December 5 the first and second bands only were measurable, but on the wonderfully clear night of December 8 all three bands were distinctly seen and recognised in and about the comet's nucleus. On each occasion the continuous spectrum already described formed the ground on which the brighter bands were superposed. The following summary shows the results of the measures, which were all made with the Grubb star-spectroscope and a simple prism of 60° angle.

Summary of Measures.

		Nov. 14.	No. of Obs.	Nov. 26.	No. of Obs.	Dec. 5.	No. of Obs.	Dec. 8.	No. of Obs.	Mean.	No. of Obs.
		mmm.		mmm.		mmm.		mmm.		mmm.	
Continuous spectrum between these limits.	Spectrum begins	575		599	1	572	2	588 574‡	1 1	580	6
	1st band, 1st condensation	...	...	555·2	1	...	...	...	...	555·2	1
	„ middle of band seen as one	...	...	...	...	544·2	3	551·5‡	3	547·8	6
	„ 2nd condensation ...	...	...	535·6	1	...	...	...	...	535·6	1
	2nd band, limit towards the red ...	...	...	517·9	4	...	...	519·8	5	519·0	9
	„ brightest part	510·5	1	515·0*	1	508·5	5	514·0† 520·0‡	3 2	512·5	12
	3rd band	476·5	1	478·8	1	...	...	472·6‡	3	474·6	5
	Spectrum ends	450	1	453	1	461	2	459	1	455	5
Distance of comet from the Sun		2·065	...	1·998	...	1·953	...	1·940	...	...	...

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* With a very wide slit, one large bright band was measured at $525{\cdot}2^{\mathrm{mmm}}$, probably due to the superposition of the first and second bands on the continuous spectrum. Feeble traces of a second band were seen at 464^{mmm}.

† On the coma with a wide slit.

‡ Spectrum of nucleus.

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From these measures it is evident that the bright bands are slowly developing under the continued action of the Sun's rays, and as the perihelion will not be reached until 1889, January 29·9, according to Dr. L. Becker's elements, they will probably become more obvious. Hitherto, however, far from the light being chiefly concentrated in these bands, nearly all the light has been spread out into a continuous spectrum, on which the bands are only seen with close attention. From this it seems probable that the comet shines mainly by reflected light (a question that the polariscope may perhaps decide), to which the action of the Sun on the cometary material is slowly adding the usual bright bands.

Lord Crawford's Observatory, Dun Echt:
1888, *December* 13.

Observations of Comets made at the Orwell Park Observatory in the years 1887–88. By John J. Plummer, M.A.

Comet V. 1887 (*Olbers–Brooks.*)

	Greenwich Mean Time.	Comet–Star. Δα.	Comet–Star. Δδ.	No. of Comps.	Comet's App. R.A.	Log ($p \times \Delta$).	Comet's App. Dec.	Log ($p \times \Delta$).	Red. to App. Place.		Comp. Star.
1887.	h m s	m s	′ ″		h m s		° ′ ″		s	″	
Sept. 12	15 31 57	+2 59·38	− 1 12·6	8–8	9 56 4·77	9·6129$_n$	+30 9 51·1	0·8208	+0·08	−7·7	1
Oct. 10	16 31 35	+1 57·67	+ 8 12·0	9–9	12 13 25·80	9·6035$_n$	+25 23 17·2	0·8108	+0·04	−5·3	2
12	16 5 31	−1 4·32	+ 3 6·4	8–8	12 22 43·50	9·5939$_n$	+24 47 3·3	0·8304	+0·04	−4·8	3
13	16 32 1	+2 2·32	+ 4 2·7	9–9	12 27 27·38	9·6000$_n$	+24 27 42·4	0·8146	+0·05	−4·9	4
17	16 55 5	+4 13·00	− 5 51·3	8–8	12 45 44·95	9·5974$_n$	+23 8 10·3	0·8053	+0·07	−4·6	5
19	16 42 43	−3 59·56	− 3 11·3	8–8	12 54 35·76	9·5944$_n$	+22 26 49·8	0·8156	+0·06	−3·8	6
21	16 30 12	−2 5·20	− 5 33·7	9–9	13 3 17·31	9·5900$_n$	+21 44 38·3	0·8252	+0·08	−3·7	7
25	17 3 12	+4 7·98	− 1 2·4	8–7	13 20 22·38	9·5887$_n$	+20 16 38·9	0·8111	+0·13	−3·7	8
28	16 42 58	−2 33·01	+ 0 3·3	8–8	13 32 36·75	9·5847$_n$	+19 9 51·7	0·8249	+0·14	−3·2	9
Nov. 4	17 1 55	−2 35·17	− 4 40·8	4–4	13 59 54·05	9·5792$_n$	+16 31 6·2	0·8218	+0·21	−2·2	10
6	17 10 13	+2 1·47	− 3 37·7	8–8	14 7 19·54	9·5771$_n$	+15 45 48·9	0·8197	+0·24	−2·3	11
14	17 9 36	+0 7·65	+ 2 35·6	6–6	14 35 23·40	9·5709$_n$	+12 48 23·4	0·8255	+0·34	−1·6	12
15	17 25 52	+3 4·12	− 9 37·7	7–7	14 38 45·54	9·5670$_n$	+12 26 0·9	0·8206	+0·35	−1·8	13
16	17 16 58	+5 44·87	− 4 2·3	6–6	14 42 3·09	9·5684$_n$	+12 4 46·9	0·8242	+0·37	−1·9	14

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